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CellCelector™ Progressive Equipment for

High throughput screening of single cells

Effective and flexible liquid handling for molecular biology

Broad spectrum of test methods for analysis of effects on cells

CellCelector is protected by US patent 9,822,331 B2
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The **Cell**Celector is a system for automatic detection, gentle isolation and precise transfer of cell colonies, single cells or parts of tissue.

Detection of Target Cells

The user sets parameters characteristic for the cells of interest (morphology, fluorescence signal). The camera scans a definable area of the culture dish and provides all position data to the software.

Isolation Process

Individual cells are aspirated in a volume between 50 nanoliters and 12 µl of liquid medium or matrigel.

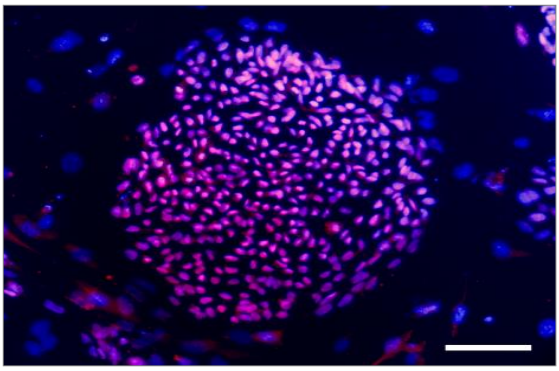
Cell colonies or tissue sections can be isolated by metallic scrape capillaries performing a scrape movement to resolve it from surrounding cells. It is most useful for tissue slices on glass slides, colonies in liquid media or within methylcellulose.

Transfer

The harvested cells or tissue material can be transferred to any type of cell culture dish, glass slides or chamber slides. The high precision of positioning cells allows for single cell arrays in multiwell plates, microengraving slides or preparation for single cell PCR.

Application in Cell Biology

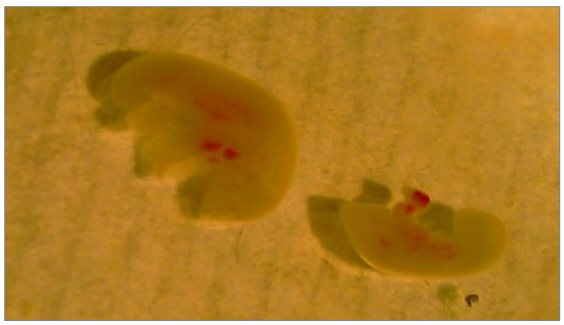
- Embryonic Stem Cells (hESC, mES), Embryoid Bodies
- Mesenchymal, Neural Stem Cells, iPS Colonies
- Spermatozoids
- B-cells, T-cells, Monocytes, Macrophages
- CHO Cells
- Hybridoma
- Non-cellular Kidney Tubuli, Yeast Cells
- Mosaic Colonies (fluorescent cells out of a non-fluorescent colony)
- Cancer Cells (breast cancer), Cancer Stem Cells
- Beta Cells, Langerhans Islets, Retina Tissue



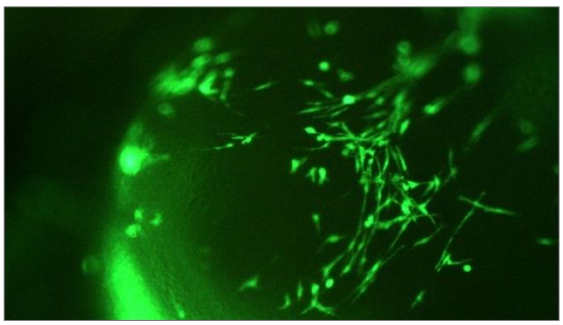
Isolation of Single Human Mesenchymal Stem Cells

Mesenchymal stem cells are multipotent cells that can give rise to cells from multiple, but limited number of lineages such as osteoblasts, myocytes, adipocytes and beta cells (pancreas). In this experiment the approach was to investigate the potential of multipotent human stem cells for re-programming initiated by an embryonic environment (chicken).

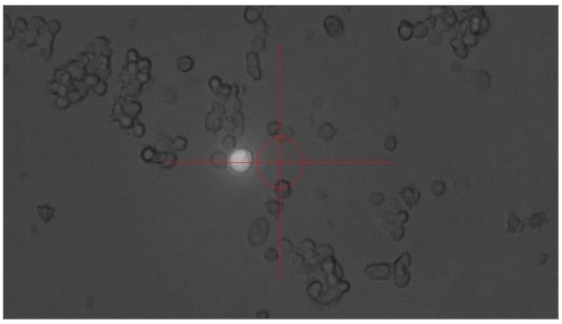
GFP positive human mesenchymal stem cells were transplanted into a chicken embryo. The embryo was harvested a few days later.



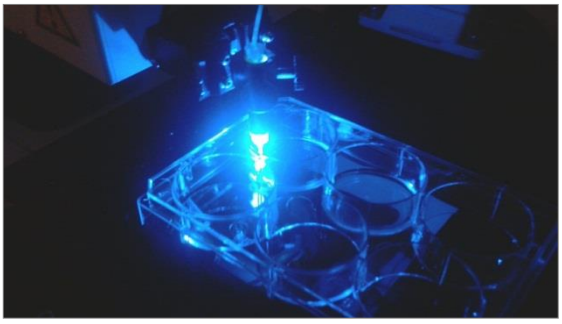
The distribution of the human cells within the embryo tissue could be visualized by the GFP fluorescence signal.

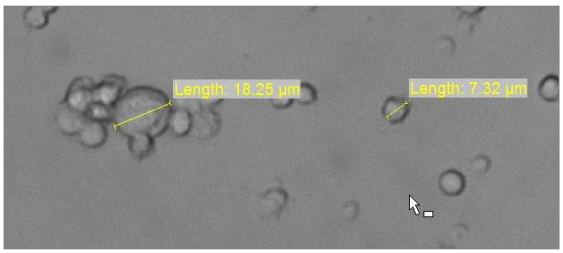


The fluorescent tissue was dissected out of the embryo and dissolved with Accutase and Trypsin. The single cell suspension consisting of chicken non-fluorescent small cells and green fluorescent larger human mesenchymal cells was analyzed by the **Cell**Celector then. As a next step the **Cell**Celector scanned the dish and identified human mesenchymal target cells upon fluorescence signal (GFP) and cell diameter



Using the glass capillaries of the **Cell**Celector Single Cell Modul the human cells (see image above) were automatically isolated in a volume of 200 nanoliters one after another and transferred into Eppendorf tubes for further genetic analysis.





Left: Large human mesenchymal cell. Right: Smaller chicken embryonic cell. Bright field mode, CellCelector software.

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The results were obtained together with Dr. Hassan Rashidi during a workshop at the Wolfson Stem Cell Center at the University of Nottingham, England in July 2010.

ALS headquarters in Jena, Germany

ALS Automated Lab Solutions GmbH is located in Jena, a dynamic city famous for microscopy and material science. ALS is a specialist for the development of innovative technological solutions for cell biology research and molecular biology. ALS lifts cell culture to a new level of choice and control on the leading edge in cell biology, cell therapy research, regenerative medicine and drug discovery. With automation and standardization of laborious manual procedures, ALS supports science and research for more efficiency and the creation of new methods for the science of tomorrow.

ALS is partner of:

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